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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,455	09/12/2003	Thanyaphong Na Nakorn	STAN-278	4085

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EXAMINER
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ART UNIT	PAPER NUMBER
1651	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/661,455	NAKORN ET AL.	
	Examiner	Art Unit	
	Lora E. Barnhart	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1;4-9,12 and 13* is/are pending in the application.

4a) Of the above claim(s) *6,9,12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. with action 4/18/07
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendments

Applicant's amendments filed 2/2/07 to claims 1, 4, and 7 have been entered. Claims 2 and 3 have been cancelled in this reply. Claims 1, 4-9, 12, and 13 remain pending in the current application, of which claims 1, 4, 5, 7, and 8 are being considered on their merits. Claims 6, 9, 12, and 13 remain withdrawn from consideration. Prior art references not included with this Office action can be found in a prior action.

Claim Objections

Claim 1 is objected to because of the following informalities: It does not end with a period. It is noted that there is a period within the claim (see end of line 4). Claims should consist of a single sentence. See M.P.E.P. § 608.01(m). Appropriate correction is required. A telephone call to applicant's representative, Pamela Sherwood, on 4/18/07 confirmed that line 5 is a typographical error.

Claim Rejections - 35 USC § 112

The rejections of record under 35 U.S.C. § 112, second paragraph, are withdrawn in light of the amendments to the claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Line 5 of claim 1 (after the period at the end of line 4) recites "Thy-1 (CD90), IL-7Rα (CD127)" but does not point out how these markers relate to the

claimed population, *i.e.* whether they are expressed or not expressed. This line of the claim shares no nexus with the remainder of the claim. A telephone call to applicant's representative, Pamela Sherwood, on 4/18/07 confirmed that line 5 is a typographical error. In the interest of compact prosecution, and in light of the conversation with Attorney Sherwood, this final line of the claim will not be considered.

Because claims 4, 5, 7, and 8 depend from indefinite claim 1 and do not clarify the point of confusion, they must also be rejected under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 102

Any art rejections under not specifically addressed below are withdrawn in light of the claim amendments. It is noted for the record, however, that in reply to the rejections over Weissman et al. (I) and (II), applicants state, "The cell populations described by Nanakorn [*sic*] *et al.* are identical to the Akashi *et al.* cell populations..." Clearly, this is a typographical error, and applicant intended to equate the populations described by Weissman et al. and the population of Akashi et al.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 7, and 8 remain rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Clay et al. (2001, *Blood* 97: 1982-1989). The claims have been interpreted as being drawn to a composition

comprising cells that express CD41, CD9, and CD34, but not 12 other particular markers. In some dependent claims, the cells have various properties when cultured under particular conditions. The claims are also drawn to a method of enriching a cell population for cells that express CD41, CD9, and CD34 comprising contacting a sample of hematopoietic cells with reagents that recognize CD41, CD9, and CD34 and selecting for cells that express CD41, CD9, and CD34. In some dependent claims, the sample of hematopoietic cells is bone marrow.

As discussed above, Clay et al. teach a purified population of cells that express CD41, CD9, and CD34 (Figure 2; page 1985, column 2). These cells were purified using immunomagnetic bead sorting, which comprises contacting human bone marrow mononuclear cells with a hapten-conjugated anti-CD34 antibody and anti-hapten antibody-coated magnetic beads, which yielded a >97% pure population of CD34+ cells (page 1983, column 1, paragraph 3). These purified CD34+ cells were further contacted with anti-CD9 antibodies and anti-CD41 antibodies and sorted to near purity using a flow cytometer (page 1983, column 1, paragraph 5; Figure 3). The population collected by gate E in Figure 3 is CD34+ $CD9^{high}$ $CD41^{high}$; the population collected by gate D in Figure 3 is CD34+ $CD9^{mid}$ $CD41^{mid/low}$ (page 1985, column 2, paragraph 1). Clay et al. further teach that adding erythropoietin (EPO) to these cells gives rise to BFU-E/MK, megakaryocyte colonies (page 1985, column 2, paragraphs 2-3); the cells of Clay et al. are therefore mammalian megakaryocyte precursor cells.

Regarding the limitation in claim 1 excluding the expression of 12 specific markers, the Patent and Trademark Office is not equipped to conduct experimentation

in order to determine whether or not applicants' cell population differs, and if so to what extent, from the cell population discussed in Clay et al. Accordingly, it has been established that the prior art cell population, which expresses CD41, CD9, and CD34 (Figure 3, box E) but not glycophorin A (Figure 1) and has the ability to differentiate to megakaryocyte colonies when treated with EPO, demonstrates a reasonable probability that it is either identical or sufficiently similar to the claimed cell population that whatever differences exist are not patentably significant. Therefore, the burden of establishing novelty or unobviousness by objective evidence is shifted to applicants.

The fact that a characteristic of a known cell population is not disclosed in a reference does not make the known cell population patentable. The instantly claimed cell population possesses inherent characteristics, for example the lack of expression of the markers recited in lines 3 and 4 of claim 1 and the response to the agents recited in claim 4, which might not be displayed in the tests used by Clay et al. Clear substantive evidence (and not merely attorney argument) that the cell population of the cited prior art does not possess a critical characteristic that is possessed by the claimed cell population would advance prosecution and might permit allowance of claims to applicants' cell population.

Applicants allege that the $CD34^{+}CD41^{+}CD9^{+}$ cells of Clay et al. comprise only a small number of monopotent progenitor cells that give rise to megakaryocyte clusters (Reply, page 5, paragraphs 2-3). These arguments have been fully considered, but they are not persuasive.

Applicants evaluated the differentiation potential of their $CD34^+CD41^+CD9^+$ cells in a methylcellulose medium comprising particular amounts of SCF, IL-3, IL-11, Flt3 ligand, GM-CSF, erythropoietin, and thrombopoietin (specification, paragraph 0075 on page 18). On the other hand, Clay et al. evaluated the differentiation potential of their $CD34^+CD41^{mid}CD9^{mid}$ cells and $CD34^+CD41^{high}CD9^{high}$ cells in another methylcellulose medium comprising particular amounts of fetal calf serum, bovine serum albumin, 2-mercaptoethanol, L-glutamine, antibiotics, erythropoietin, stem cell factor, IL-1β, IL-3, IL-6, GM-CSF, and G-CSF (page 1983, column 2, paragraph 2). The combinations of differentiation-inducing agents comprised in the two media are distinct; both media do comprise methylcellulose, IL-3, GM-CSF, and erythropoietin, but otherwise their contents do not overlap. Applicants have provided no evidence that the $CD34^+CD41^+CD9^+$ cells of Clay et al. would not be monopotent in the methylcellulose medium employed in the instant application; in other words, the monopotency of the instantly claimed cells may depend on the medium in which they are cultured, not on the set of expressed and nonexpressed markers.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lora E. Barnhart whose telephone number is 571-272-1928. The examiner can normally be reached on Monday-Thursday, 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SANDRA E. SAUCIER
PRIMARY EXAMINER